

What is claimed is:

1. A method of transferring data from a source to a destination, the source being adapted to receive a plurality of packets of data for transfer to the destination, the method comprising:
 - for each packet of data to be transferred, splitting the data into a first portion and a second portion;
 - associating a first synchronization code with the first portion of data for each packet;
 - associating a second synchronization code with the second portion of data for each packet;
 - with a first processor, analyzing the first portion of data and the associated first synchronization code for each packet of data to identify a first state associated with the first portion of data for each packet;
 - for each packet of data, storing the first portion of data, its associated first synchronization code and the associated first state in a first storage device;
 - with a second processor, analyzing the second portion of data and the associated second synchronization code for each packet of data to identify a second state associated with the second portion of data for each packet;
 - for each packet of data, storing the second portion of data, its associated second synchronization code and the associated second state in a second storage device; and
 - with a third processor, (i) reading from the first storage device one of the first portions of data stored therein, its associated first synchronization code, and its associated first state, (ii) reading from the second storage device one of the second portions of data stored therein, its associated second synchronization code, and its associated second state, (iii) determining whether the first and second portions of data were generated from the same packet of data, and (iv) if the first and second portions of data were generated from the same packet of data,

combining them to regenerate the packet of data.

2. The method of claim 1 further comprising, if the first and second portions of data were not generated from the same packet of data, performing a recovery operation to recover synchronization of the portions of data.
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3. The method of claim 2 wherein the recovery operation comprises discarding at least one portion of data.
- 10 4. The method of claim 2 wherein the recovery operation comprises discarding portions of data read from one of the first and second storage devices until a synchronization code of a portion of data read from the one of the first and second storage devices indicates that the associated portion of data came from the same packet of data as a portion of data read from the other of the first and second
15 storage devices.
5. The method of claim 1 wherein the synchronization codes for like portions of successive packets of data are set to a series of values which repeats periodically.
- 20 6. The method of claim 5 wherein each of the synchronization codes for like portions of packets of data is set to one of three values.
7. The method of claim 6 wherein one of the values is an idle value, wherein portions of packets of data associated with the idle value synchronization code are
25 grouped in succession between portions of packets of data associated with synchronization codes having the other two values.
8. The method of claim 7 wherein identifying a state can include counting a number of successive portions of packets assigned an idle value synchronization code.

9. The method of claim 1 wherein each of the first and second storage devices comprises a first-in-first-out (FIFO) storage device.

5 10. The method of claim 1 wherein the third processor determines whether the first and second portions of data were generated from the same packet of data without transferring any information to the first and second processors.

10 11. An apparatus for transferring data from a source to a destination, the source being adapted to receive a plurality of packets of data for transfer to the destination, the apparatus comprising:

15 a splitting device for (i) receiving from the source each packet of data to be transferred to the destination and splitting each packet of data into a first portion and a second portion, (ii) associating a first synchronization code with the first portion of data for each packet, and (iii) associating a second synchronization code with the second portion of data for each packet;

a first processor for analyzing the first portion of data and the associated first synchronization code for each packet of data to identify a first state associated with the first portion of data for each packet;

20 a first storage device for storing, for each packet of data, the first portion of data, its associated first synchronization code and the associated first state;

a second processor for analyzing the second portion of data and the associated second synchronization code for each packet of data to identify a second state associated with the second portion of data for each packet;

25 a second storage device for storing, for each packet of data, the second portion of data, its associated second synchronization code and the associated second state; and

a third processor for (i) reading from the first storage device one of the first portions of data stored therein, its associated first synchronization code, and

its associated first state, (ii) reading from the second storage device one of the second portions of data stored therein, its associated second synchronization code, and its associated second state, (iii) determining whether the first and second portions of data were generated from the same packet of data, and (iv) if the first and second portions of data were generated from the same packet of data, combining them to regenerate the packet of data.

12. The apparatus of claim 11 wherein, if the first and second portions of data were not generated from the same packet of data, the third processor performs a recovery operation to recover synchronization of the portions of data.

13. The apparatus of claim 12 wherein, in the recovery operation, the third processor discards at least one portion of data.

14. The apparatus of claim 12 wherein, in the recovery operation, the third processor discards portions of data read from one of the first and second storage devices until a synchronization code of a portion of data read from the one of the first and second storage devices indicates that the associated portion of data came from the same packet of data as a portion of data read from the other of the first and second storage devices.

15. The apparatus of claim 11 wherein the synchronization codes for like portions of successive packets of data are set to a series of values which repeats periodically.

16. The apparatus of claim 15 wherein each of the synchronization codes for like portions of packets of data is set to one of three values.

17. The apparatus of claim 15 wherein one of the values is an idle value, such that portions of packets of data associated with the idle value synchronization code are

grouped in succession between portions of packets of data associated with synchronization codes having the other two values.

18. The apparatus of claim 17 wherein the first and second processors count a number of successive portions of packets assigned the idle value synchronization code to identify the first and second states.

19. The apparatus of claim 11 wherein each of the first and second storage devices comprises a first-in-first-out (FIFO) storage device.

20. The apparatus of claim 11 wherein the third processor determines whether the first and second portions of data were generated from the same packet of data without transferring any information to the first and second processors.

21. A method of recombining portions of data packets into their original data packets to synchronize transfer of the portions of data packets along multiple separate data paths, a first portion of each data packet being received from a first data path and being stored in a first storage device and a second portion of each packet of data being received from a second data path and being stored in a second storage device, said method comprising:

reading from the first storage device one of the first portions of data, a first synchronization code associated with the first portion of data, and a first state associated with the first portion of data;

reading from the second storage device one of the second portions of data, a second synchronization code associated with the second portion of data, and a second state associated with the second portion of data;

analyzing the first and second synchronization codes and the first and second states associated with the first and second portions of data, respectively, to determine whether the first and second portions of data were generated from the

same packet of data; and

if the first and second portions of data were generated from the same packet of data, combining them to regenerate the packet of data.

- 5 22. The method of claim 21 wherein it is determined whether the first and second portions of data were generated from the same packet of data without transferring information back along the multiple separate data paths.
- 10 23. The method of claim 21 further comprising, if the first and second portions of data were not generated from the same packet of data, performing a recovery operation to recover synchronization of the portions of data.
- 15 24. The method of claim 23 wherein the recovery operation comprises discarding at least one portion of data.
- 20 25. The method of claim 23 wherein the recovery operation comprises discarding portions of data read from one of the first and second storage devices until a synchronization code of a portion of data read from the one of the first and second storage devices indicates that the associated portion of data came from the same packet of data as a portion of data read from the other of the first and second storage devices.
- 25 26. An apparatus for recombining portions of data packets into their original data packets to synchronize transfer of the portions of data packets along multiple separate data paths, a first portion of each data packet being received from a first data path and being stored in a first storage device and a second portion of each packet of data being received from a second data path and being stored in a second storage device, said apparatus comprising a processor for (i) reading from the first storage device one of the first portions of data, a first synchronization

code associated with the first portion of data, and a first state associated with the first portion of data, (ii) reading from the second storage device one of the second portions of data, a second synchronization code associated with the second portion of data, and a second state associated with the second portion of data, (iii) analyzing the first and second synchronization codes and the first and second states associated with the first and second portions of data, respectively, to determine whether the first and second portions of data were generated from the same packet of data, and (iv) if the first and second portions of data were generated from the same packet of data, combining them to regenerate the packet of data.

27. The apparatus of claim 26 wherein the processor determines whether the first and second portions of data were generated from the same packet of data without transferring information back along the multiple separate data paths.

28. The apparatus of claim 26 wherein the processor performs a recovery operation to recover synchronization of the portions of data if the first and second portions of data were not generated from the same packet of data.

29. The apparatus of claim 28 wherein, in performing the recovery operation, the processor discards at least one portion of data.

30. The apparatus of claim 28 wherein, in performing the recovery operation, the processor discards portions of data read from one of the first and second storage devices until a synchronization code of a portion of data read from the one of the first and second storage devices indicates that the associated portion of data came from the same packet of data as a portion of data read from the other of the first and second storage devices.